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Economics of Producing Alfalfa for Dehydrating Plants in Ohio

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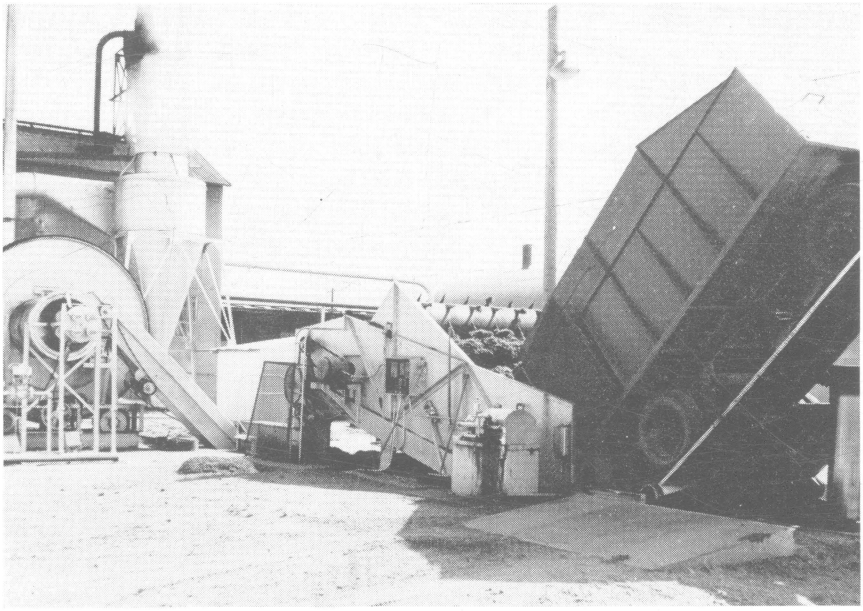

OHIO AGRICULTURAL EXPERIMENT STATION - - WOOSTER, OHIO

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ECONOMICS OF PRODUCING ALFALFA FOR DEHYDRATING PLANTS IN OHIO

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OBJECTIVES

The objectives of this study were as follows: (1) To consider differences on farms which might influence a decision as to whether or not to sell alfalfa meadows for dehydration; (2) To determine reasons why some growers sell alfalfa meadows to dehydrating plants while others harvest meadows as hay; and (3) To determine the profitability of selling alfalfa meadows to dehydrating plants.

HOW STUDY WAS MADE

Two groups of farmers were selected at random from three areas in which alfalfa meadows were sold to dehydrating plants. One group included 64 farmers who sold all or part of their meadows for dehydration. The other group included 63 farmers who did not sell any meadow crops to dehydrating plants. The areas studied were located near Defiance, Ohio in Defiance County, Dunbridge, Ohio in Wood County, and Ashville, Ohio in Pickaway County. The number of farms studied in each plant area is shown in Table 1.

Data collected for the two groups of farms for 1962 included land use, livestock numbers, crop yields, cropping practices, labor supply, land tenure, and number of days the farm operator worked off the farm. Reasons also were obtained as to why some farmers sold meadows to dehydrating plants while others preferred to use their meadow crops in some other way.

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[2]Assistance in collecting and analyzing the data was given by Thomas Stickley and David Weisenborn.

TABLE 1.—Number of Farmers Interviewed in Each Plant Area for the Two Groups of Farms.

Location of Plant	Farmers Selling Alfalfa to Dehydrating Plants	Farmers Not Selling Alfalfa to Dehydrating Plants
Defiance	20	20
Dunbridge	20	20
Ashville	24	23
Total	64	63

DIFFERENCES ON FARMS THAT MIGHT INFLUENCE A FARMER IN DECIDING WHETHER OR NOT HE SHOULD SELL ALFALFA MEADOWS FOR DEHYDRATION

This study showed no significant difference in the total acreage of land operated by the two groups of farmers. There was, however, a noticeable difference in the cropping programs used on the rotated land (Table 2). Farmers who sold alfalfa meadows to dehydrating plants raised less grain and more meadow per hundred acres of cropland than farmers who harvested meadows as hay. The former group had 27 percent of their rotated land in meadows compared with 15 percent for the latter group. No significant differences in the yields of grain or hay were reported by the two groups of farmers.

Farms on which alfalfa meadows were sold to dehydrating plants differed from the ones on which meadows were harvested as hay in the following ways (Table 3): (1) operators had only two-thirds as much family labor; (2) twice as many operators were more than 60 years of age; (3) farms were carrying only one-third as much hay consuming livestock per 100 acres of meadow; (4) fifty percent more

TABLE 2.—Percent of Land in Various Crops in 1962 on 127 Farms in Alfalfa Study.

Land Use	64 Farms from Which Meadows Were Sold to Dehydrating Plants	63 Farms from Which No Meadows Were Sold to Dehydrating Plants
	(Percent of Total Farm Acreage)	(Percent of Total Farm Acreage)
Corn	16**	25**
Soybeans	14**	23**
Small Grain	14	17
Truck Crops	5**	1**
Meadow	22**	13**
Land Taken Out of Production by U.S. Government Programs	10*	5*
Rotated Land (subtotal of above)	(81)	(84)
Permanent Pasture	5	6
Woods	8	5
Miscellaneous	6	5
Total Farm Area	100	100

In the comparisons above, the hypothesis was advanced that no difference existed between the percentages of a particular crop grown on the two groups of farms. For example, the assumption was made that no real difference existed between the 16 percent and 25 percent acreage in corn since both were assumed to be random fluctuations from the same average percentage of total land in the farming unit. Where this was not true, asterisks are used to indicate the probability that the hypothesis is false. *Signifies a difference significantly large at the .05 level of probability; **signifies a difference significantly large at the .01 level of probability.

TABLE 3.—Differences on Farms That Might Influence a Farmer in Deciding Whether or Not He Should Sell Alfalfa Meadows for Dehydration.

	64 Farms from Which Meadows Were Sold to Dehydrating Plants	63 Farms from Which No Meadows Were Sold to Dehydrating Plants
Percent of Farms Having No Hay Consuming Livestock	59**	38**
Animal Units of Hay Consuming Livestock Per 100 Acres of Cropland[1]	3.9	6.0
Animal Units of Hay Consuming Livestock Per 100 Acres of Meadows	15**	41**
Average Age of Operators, Years	56**	49**
Percent of Operators Over 60 Years Old	48**	25**
Percent of Operators Who Are Widows	8**	0**
Percent of Operators Who Work Full-Time Off Farm	23**	10**
Amount of Family Help Working With Operator, Persons	.9**	1.4**
Percent of Operators Owning All of Farming Unit	67**	33**

[1]One animal unit of hay consuming livestock is approximately equal to 1 dairy cow, 1 beef cow, 4 feeder cattle, 7 ewes or 20 feeder lambs.

**Differences in related means are significant at the .01 level.

of the operators did not have hay consuming livestock; (5) twice as many farms were handled by part-time operators; (6) more operators were widows; and (7) twice as many operators owned all their farming units.

REASONS FOR AND AGAINST SELLING ALFALFA TO DEHYDRATING PLANTS

The average length of time during which the 64 farmers sold alfalfa meadows to dehydrating plants was almost nine years. These farmers normally used their meadow crops as follows: 68 percent of the meadow acreage was sold for dehydration; 11 percent was harvested as hay; 9 percent was not harvested or pastured; 8 percent was in U. S. Government crop control programs; and 4 percent was pastured throughout the growing season. Eighty-five percent of the meadows sold for dehydration was produced on land owned by the operator, the remaining 15 percent being produced on rented land. The usual practice was to cut the meadows four times a year when they were sold for dehydration.

The 64 farmers were asked the question, "Why do you sell alfalfa to a dehydrating plant?". In reply to this question, most farmers gave more than one reason. Farmers reported various reasons as follows: 48 did not want to hire help or use available family labor to make hay; 30 did not have enough livestock to consume all of the meadows when harvested as hay; 10 did not want to make machinery and storage investments needed for harvesting meadows as hay; 8 thought meadows sold for dehydration were as profitable as making them into hay; 7 wanted to eliminate the weather risk in making hay; 5 wanted to add a cash crop to their farming operations; 4 thought meadows sold for dehydration were as profitable as grain grown on poor land; and 3 thought meadows sold to dehydrating plants were more profitable than renting land to a tenant on a crop-share basis.

In reply to another question, "Why don't you sell more alfalfa meadows to a dehydrating plant?", farmers gave answers as follows: 41 were selling all of their meadows for dehydration; 13 needed some hay to feed their livestock; 2 were able to make some hay and sell it for a satisfactory price; 2 said an adequate supply could be obtained closer to the plant; 2 objected to the way the harvesting equipment destroyed soil structure in certain fields; 1 had difficulty getting the employees of the dehydrating plant to cut the alfalfa at the proper time; 1 was not satisfied with plant policy· and 2 gave no reasons.

When asked what would be done with alfalfa meadows if they could not be sold to dehydrating plants, 39 farmers said they would raise a smaller amount and 34 said they would harvest all of their alfalfa meadows as hay. They said that in these instances, some of the hay would be fed to additional livestock and some would be sold.

A survey of the 63 farmers who were not selling any alfalfa to dehydrating plants in 1963 showed that 30 had sold some meadows for dehydration in recent years. At the same time 33 had never sold any meadow crops in this way. In reply to the question, "Why don't you sell a part or all of your meadows to a dehydrating plant?" answers were as follows: 19 harvested all of their meadows as hay to provide their livestock with the required amount of forage; 12 thought the price paid for an acre of standing alfalfa was too low; 12 did not raise the type of meadow that was normally used for dehydration; 8 objected to the way harvesting equipment destroyed soil structure; 4 plowed the entire meadow crop under for soil improvement; 3 objected to requirements set by the manager of the dehydrating plant; 1 could make more money selling hay· and 4 gave no specific reasons.

Farmers who did not sell any meadow crops for dehyration raised more clover and less alfalfa than farmers who sold meadows to a dehydrating plant.

INCOME FROM ALFALFA SOLD TO DEHYDRATING PLANTS

Figures in Table 4 show that an acre of alfalfa sold to a dehydrating plant for $11 a ton when dried gave about the same profit as an acre of hay which sold for $21.25 a ton at the farm. Receipts for dehydrated meadows were based on four cuttings which produced 3.5 tons per acre of dried alfalfa and receipts for hay were figured for three cuttings producing 3.5 tons per acre. These yields, which were given by the farmers, represent the estimated normal production for the two different methods of harvesting meadows. Costs of producing alfalfa for hay and dehydration are based on keeping the crop three years in the rotation. The length of time that the farmers normally kept a stand of alfalfa that was sold for dehydration was about three and three-quarters years.

Prices used in figuring costs were $1.50 per hour for all labor and $1.25 per hour for the tractor power used. Obviously, a lower price for hay would increase the profitability of selling meadows to dehydrating plants and a higher price would reduce the profitability.

The profits shown in Table 4 are based on the assumption that a cash payment is actually made for all labor used. However, there are some farmers who have surplus labor which can be used to make hay. Under these conditions, harvesting the meadows as hay should normally produce a higher labor and management income than selling meadows

TABLE 4.—Receipts, Expenses and Profits Per Year from an Acre of Hay and an Acre of Meadow Sold to a Dehydrating Plant.[1]

	Meadow Harvested as Hay	Meadow Sold to Dehydrating Plant
Receipts	$74.40	$38.50
Expenses		
Man Labor	13.50	.30
Tractor Power	7.25	.25
Machinery	13.75	.05
Fertilizer	4.50	4.50
Lime	1.00	1.00
Seed	1.65	1.65
Baler Twine	2.25	.00
Land	18.00	18.00
Total	61.90	25.75
Profit Per Acre Per Year	12.50	12.75

[1]Expenses in Tables 4 and 5 are based on the cost data given in the following publications: R. H. Blosser, "Crop Costs and Returns in West-Central Ohio", Ohio Agricultural Experiment Station Research Bulletin 909, June 1962; and Blosser, R. H., "Cost of Producing Crops in Northwestern Ohio", Ohio Agricultural Experiment Station, Research Bulletin 923, September 1962.

to a dehydrating plant. However, this increase in income may be small in years when the price of hay is low or in wet seasons when poor quality hay is produced. A grower with a shortage of labor may find that meadows sold to a dehydrating plant are more profitable than hiring labor to make hay.

Meadows sold for dehydration were established in two ways. On about two-thirds of the farms, the old meadow was plowed under and in its place one or more crops of corn and soybeans were grown. These crops were followed by wheat or oats in which the new alfalfa seeding was made. On the other one-third of the farms, the old meadow was plowed under and a new alfalfa seeding was made without raising any corn or soybeans. In most cases, the new seeding was made with a companion crop of wheat or oats. But in a few cases, no companion crop was used.

Meadows sold for dehydration not only compete with meadows harvested as hay but also compete with corn and soybeans which are often more profitable than meadows, regardless of how they are harvested.

Profits from raising different amounts of alfalfa meadows in the rotation are shown in Table 5. These figures, which are based on normal yields, show that net income declines as more meadows and less grain are raised on a given area of land. Loss of income results because corn and soybeans produce greater profits per acre than meadows harvested as hay or sold to dehydrating plants. Higher yields from meadows in relation to grain would make meadows more profitable than this study indicates. On the contrary, higher grain yields relative to hay would make grain crops more profitable.

Profits for the various rotations were based on the following yields per acre and prices received at the farm: corn, 80 bushels at $1.00; soybeans, 30 bushels at $2.25; wheat, 32 bushels at $1.75; oats, 65 bushels at $.65; meadows harvested as hay, 3.5 tons at $22; and meadows sold to dehydrating plants, 3.5 tons at $11. When a new seeding was made without a companion crop, 1.5 tons per acre of dehydrated alfalfa at $13 a ton was used in figuring gross receipts for the year in which the new seeding was made.

Labor was charged $1.50 an hour and tractor time at $1.25. When a farmer harvested part of his meadow for hay and sold the balance to a dehydrating plant, all hay making equipment costs were charged against that portion of the meadow harvested as hay. When all meadow crops were sold to dehydrating plants, the assumption was

TABLE 5.—Receipts, Expenses and Profits Per Acre for Different Rotations.

	Corn Soybeans Wheat Meadow[1]	Corn Soybeans Wheat Meadow[2]	Corn Soybeans Wheat Meadow[2] Meadow[2]	Corn Wheat Meadow[2] Meadow[2] Meadow[2]	Wheat Meadow[2] Meadow[2] Meadow[2] Meadow[2]	Oats Meadow[2] Meadow[2] Meadow[2] Meadow[2]	New Seeding Meadow[2] Meadow[2] Meadow[2] Meadow[2]
Receipts	$70.15	$60.50	$56.10	$50.30	$42.00	$39.25	$34.70
Expenses							
Man Labor	8.85	5.55	4.50	3.10	1.35	1.30	.70
Tractor Power	5.80	4.05	3.30	2.25	1.00	.95	.55
Machinery	9.30	5.90	4.70	3.15	1.55	1.50	.45
Fertilizer	6.75	6.75	6.80	7.45	5.85	5.75	5.20
Lime	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Seed	3.70	3.70	2.95	2.35	1.95	1.55	1.00
Spray	.15	.15	.10	.10	.00	.00	.00
Baler Twine	.55	.00	.00	.00	.00	.00	.00
Land	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Total	54.10	45.10	41.35	37.40	30.70	30.05	26.90
Profit Per Acre	16.05	15.40	14.75	12.90	11.30	9.20	7.80

[1]Harvested as hay.

[2]Sold to a dehydrating plant.

made that no hay making equipment was owned by the farmer, and consequently, no charges were made for use of such equipment.

No charges for fertilizer were made against meadows which were harvested the first year after a new seeding was made. This procedure was based on the assumption that the first year of meadow after the year of seeding would add enough nitrogen in roots and stubble to offset the cost of the phosphorus and potash that should be replaced. However, this nitrogen credit could not be recovered by the farmer until he raised a grain crop, this usually requiring a crop of corn. For all meadow after the first year of harvest following the year of seeding, a fertilizer charge of $7 an acre was made for each year the meadow remained in the rotation. When a new meadow was established without a companion crop, a fertilizer charge of $5 an acre was made for the year in which the new seeding was established.

In calculating profits for the different rotations, no credit for improving soil structure was given to meadow crops. Therefore, profits from meadows might be increased slightly for certain soils, the amount depending upon how much the improved soil structure adds to monetary returns from succeeding crops.

On an individual crop basis, calculations showed that 3.5 tons of dried alfalfa which was sold to a dehydrating plant for $11 a ton gave about the same profit per acre as 71 bushels of corn that sold for $1.00 a bushel at the farm, 27 bushels of soybeans at $2.25, 36 bushels of wheat at $1.75, 95 bushels of oats at $ .65 or 3.5 tons of hay at $21.25 a ton at the farm.

This study shows that when dried alfalfa brings the farmer an average of $11 a ton, alfalfa meadows can be profitably marketed through dehydrating plants when the following situations exist: the meadow must be located near a dehydrating plant; the farmer does not need the meadow for livestock feed; additional labor must be hired to harvest the meadow as hay; and the average selling price for hay is $21.25 or less per ton at the farm. Two of these conditions are usually found on farms operated by part-time operators, semi-retired farmers, landlords and widows.